

**IN THE CLAIMS:**

Claims 1-10, 12, 13, and 21-30 have been amended herein. New claims 31-63 have been added herein. All of the pending claims 1 through 63 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

**Listing of the Claims:**

1. (Currently Amended) An isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species, said *thyA* mutant comprising:

a defective thymidylate synthase gene;

~~wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5~~ wherein said strain of *Lactococcus* species comprises a thymidylate synthase gene comprising

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO: 1; and

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO: 2.

2. (Currently Amended) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 1, wherein said defective thymidylate synthase gene has been inactivated by gene disruption.

3. (Currently Amended) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 1, wherein the *Lactococcus* species is *Lactococcus lactis*.

4. (Currently Amended) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 2, wherein the *Lactococcus* species is *Lactococcus lactis*.

5. (Currently Amended) ~~A transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 1, wherein said (*thyA*) mutant *Lactococcus* species comprising a defective thymidylate synthase gene, and further comprising a is transformed with a transforming plasmid,

~~wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5; and~~

wherein said transforming plasmid does not comprise an ~~intact~~ functional thymidylate synthase gene.

6. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 5, further comprising a gene encoding a molecule of interest.

7. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 5, wherein said molecule of interest is Interleukin-10.

8. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 5, wherein said *Lactococcus* species is *Lactococcus lactis*.

9. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 8, wherein the *Lactococcus lactis* comprises a gene encoding a molecule of interest.

10. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 9, wherein the molecule of interest is Interleukin-10.

11. (Withdrawn) A method for delivering a molecule of interest to a subject, said method comprising administering the transformed strain of *Lactococcus* species of claim 6 to the subject.

12. (Currently Amended) A composition comprising:  
~~a transformed strain of *Lactococcus* species comprising a defective thymidylate synthase gene, and further comprising a transforming plasmid, wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5; and~~  
wherein said transforming plasmid does not having comprise an intact thymidylate synthase gene the isolated thymidylate synthase (*thyA*) mutant of a strain of a *Lactococcus* species of claim 5.

13. (Currently Amended) The composition of claim 12, wherein ~~the *Lactococcus* species~~ the isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species further comprises a gene encoding a molecule of interest.

14. (Original) The composition of claim 13, wherein said molecule of interest is Interleukin-10.

15. (Original) The composition of claim 12, wherein said *Lactococcus* species is *Lactococcus lactis*.

16. (Original) The composition of claim 15, wherein the *Lactococcus lactis* comprises a gene encoding a molecule of interest.

17. (Original) The composition of claim 16, wherein the molecule of interest is Interleukin-10.

18. (Withdrawn) A method of treating inflammatory bowel disease in a subject, said method comprising:

administering to the subject a transformed strain of *Lactococcus* species of claim 6.

19. (Withdrawn) The method of claim 18, wherein the molecule of interest is Interleukin-10.

20. (Withdrawn) A method for delivering a molecule of interest to a subject, said method comprising administering the transformed strain of *Lactococcus* species of claim 9 to the subject.

21. (Currently amended) An isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* bacterium, said *thyA* mutant comprising:

a genome, and, incorporated into said genome, a means for encoding a defective thymidylate synthase gene; and

wherein said genome has been genetically modified ~~in comparison to wild type *Lactococcus*~~ through introducing a defect in said *thyA*.

22. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 21, wherein ~~the means for encoding a defective thymidylate synthase gene comprises a thymidylate synthase gene selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5~~ said strain of *Lactococcus* bacterium comprises a thymidylate synthase gene selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5.

23. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 21, wherein the *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

24. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 21, further comprising a transforming plasmid; and wherein said transforming plasmid does not comprise an intact thymidylate synthase gene.

25. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 24, further comprising a gene encoding a molecule of interest.

26. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 25, wherein said molecule of interest is Interleukin-10.

27. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 24, wherein said *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

28. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 27, wherein the *Lactococcus lactis* bacterium comprises a gene encoding a molecule of interest.

29. (Currently amended) The isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 28, wherein the molecule of interest is Interleukin-10.

30. (Currently amended) A composition comprising: the isolated ~~*Lactococcus* bacterium~~ thymidylate synthase (*thyA*) mutant of claim 21.

31. (New) The isolated *thyA* mutant of a strain of *Lactococcus* species of claim 1, wherein said strain of *Lactococcus* species comprises a thymidylate synthase gene selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5.

32. (New) An isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species, said *thyA* mutant produced by a process comprising:

providing a strain of *Lactococcus* species comprising thymidylate synthase gene comprising

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO: 1; and

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO:2; and

introducing a defect in said thymidylate synthase gene.

33. (New) The isolated *thyA* mutant of a strain of *Lactococcus* species according to claim 32, wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5 and introducing a defect in said thymidylate synthase gene.

34. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 32, wherein said defective thymidylate synthase gene has been inactivated by gene disruption.

35. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 32, wherein the *Lactococcus* species is *Lactococcus lactis*.

36. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 34, wherein the *Lactococcus* species is *Lactococcus lactis*.

37. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 32, wherein said (*thyA*) mutant is transformed with a transforming plasmid,

wherein said transforming plasmid does not comprise an intact thymidylate synthase gene.

38. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 37, further comprising a gene encoding a molecule of interest.

39. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 37, wherein said molecule of interest is Interleukin-10.

40. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 37, wherein said *Lactococcus* species is *Lactococcus lactis*.

41. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 40, wherein the *Lactococcus lactis* comprises a gene encoding a molecule of interest.

42. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 41, wherein the molecule of interest is Interleukin-10.

43. (New) An isolated thymidylate synthase (*thyA*) mutant of a *Lactococcus* bacterium, said *thyA* mutant comprising a defective thymidylate synthase gene, wherein said defective thymidylate synthase gene has been genetically modified through introducing a defect in said thymidylate synthase gene.

44. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43, wherein the defective thymidylate synthase gene has been inactivated by gene disruption.

45. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43, wherein the *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

46. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43, further comprising a transforming plasmid; and wherein said transforming plasmid does not comprise an intact thymidylate synthase gene.

47. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 46, further comprising a gene encoding a molecule of interest.

48. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 47, wherein said gene encoding a molecule of interest is integrated within the defective thymidylate synthase gene.

49. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 47, wherein said gene encoding a molecule of interest replaces a part of or the entire thymidylate synthase gene of said *Lactococcus* bacterium.

50. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 48, wherein said molecule of interest is a prophylactic or therapeutic molecule.

51. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 49, wherein said molecule of interest is a prophylactic or therapeutic molecule.

52. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 47, wherein said molecule of interest is Interleukin-10.

53. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 46, wherein said *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

54. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 53, wherein the *Lactococcus lactis* bacterium comprises a gene encoding a molecule of interest.



55. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 54, wherein said gene encoding a molecule of interest is integrated within the defective thymidylate synthase gene.

56. The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 54, wherein said gene encoding a molecule of interest replaces a part of or the entire thymidylate synthase gene of said *Lactococcus* bacterium.

57. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 55, wherein said molecule of interest is a prophylactic or therapeutic molecule.

58. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 56, wherein said molecule of interest is a prophylactic or therapeutic molecule.

59. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 54, wherein the molecule of interest is Interleukin-10.

60. (New) A composition comprising the isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43.

61. (New) A pharmaceutical composition comprising the isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43.

62. (New) An improvement in isolated *Lactococcus* bacterium comprising SEQ ID NO:3 or SEQ ID NO:5, wherein the improvement comprises:  
a defect in SEQ ID NO:3 or SEQ ID NO:5

63. (New) An improvement in isolated *Lactococcus* bacterium comprising SEQ ID NO:3 or SEQ ID NO:5, wherein the improvement comprises:  
a defective thymidylate synthase.